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## MR. CHARLES S. PEIRCE'S ONSLAUGHT ON THE DOCTRINE OF NECESSITY.

THE problem of necessity lurks at the bottom of all problems, and according as we accept or reject the idea of necessity we shall be led to two entirely different world-conceptions.

The conception of indeterminism generally offers itself first to the doubting mind ; and it is apparently a pleasant idea. It promises freedom, it leaves room for the imagination, it makes the world and its possibilities wide, much wider than it could be on the plan of determinism. Determinism is at first sight an oppressive notion and we naturally shrink from it. It seems to destroy the freedom of the will and all moral responsibility. From infinite possibilities it narrows the world down to one single actuality ; and thus it seems to destroy all the charms of life.

The former view may be represented as conceiving the all-power of the whole in which and through which we live as a well meaning and yielding ruler or a kind-hearted parent who if strongly plied with prayer, will for a trifle in order to please an importune favorite change his decisions. The dispensations of his government will be full of exceptions, of private cabinet decrees, of counter orders and irregularities. The latter view, however, would represent the entirety of the All as an inexorable and uncompromising sovereign, or as a severe educator, a stern father who unfalteringly clings to his principles. He leaves full independence to his children, he does not prevent their mistakes, yet rigidly lets them bear the consequences of their actions. He never answers prayers except that the prayer itself has its educating effects upon him who prays ; but he

never alters objective facts for the sake of him who requests his interference, and he never makes exceptions either in favor or disfavor of anybody. In brief ; the God of him who accepts the former view, will be Chance, while the God of him who accepts the latter view will be Law.

The choice between the two views seems to remind us of the choice left to the heroes of our fairy tales. He who chooses that which appears pleasant will be led into inextricable confusion, he who chooses that which appears rigid and oppressive will be led on a path where in spite of many difficulties he will be able to make firm and certain steps and will arrive at clearness as well as moral freedom. It is not the golden casket that contains Portia's picture.

Science constantly operates on the basis of the maxim that there is no chance, that everything that happens, happens as it does with necessity. The question is, Is this maxim a mere assumption, a non-verifiable working hypothesis ; or is there any reliable evidence in its favor ? Is it true, and if it is, how can it be proved ?

## I.

## DAVID HUME REDIVIVUS.

Mr. Charles S. Peirce's article entitled "The Doctrine of Necessity Examined," which appeared in the last number of *The Monist*, must have been a surprise to many thinking readers. It must have affected them in a somewhat similar manner as Hume's "Treatise of Human Nature" affected Kant. It roused him from his dogmatic slumber : He abandoned dogmatism but nevertheless did not accept Hume's skepticism ; he remained positive ; yet he propounded a better positive view than was the old dogmatism ; he established in philosophy the method of critique.

The parallelism between David Hume, who doubted the validity of our conception of causation, and Mr. Charles S. Peirce who denies the universality of the doctrine of necessity, is very marked in more than one respect. It is, in spite of many differences, a case of close analogy, and the answer which we shall have to give to either, will in many respects be suited to both. Both shake the

ultimate ground of scientific research at its very root. Both call in question the most fundamental concept upon which all our methods of investigation and philosophy rest. Both challenge the reliability of an idea of which few would hesitate to say that it is all but universally accepted. In fact the ideas "causation" and "necessity" are more than kin. If analysed, many of their elements will be found to be actually identical. Thus the one cannot be either established or doubted without establishing or doubting the other. Accordingly Mr. Peirce, in some respect, repeats David Hume's onslaught upon the current conception of the basis of human knowledge with the more formidable weapons which a century of close thought and scientific investigation have furnished him.

If Kant's answer to Hume had been satisfactory, Mr. Peirce probably would not have renewed the attack or he would have had to modify it considerably. Kant, however, whom we both, Mr. Peirce as much as I myself, admire as a master of philosophic thought, did not solve the question satisfactorily. Yet Kant pointed out the way of solving it, which was the middle way between dogmatism and scepticism, called by him and his followers "Criticism," and it is this way on which we trust is safest travelling.

Mr. Peirce is right that the doctrine of necessity cannot be "postulated," for "to postulate a proposition is no more than to hope it will be true." The doctrine of necessity is, indeed, usually treated as a postulate, and Mr. Peirce's attack appears formidable because he shows the weakness of the arguments which are commonly brought forward in its favor and which we grant to be insufficient.

Mr. Peirce says (*The Monist*, II, 3, p. 330):

"In view of all these considerations, I do not believe that anybody, not in a state of casehardened ignorance respecting the logic of science, can maintain that the precise and universal conformity of facts to law is clearly proved, or even rendered particularly probable, by any observations hitherto made. In this way, the determined advocate of exact regularity will soon find himself driven to *a priori* reasons to support his thesis. These received such a sockdologer from Stuart Mill in his Examination of Hamilton, that holding to them now seems to me to denote a high degree of imperviousness to reason; so that I shall pass them by with little notice."

Mr. Peirce is right when saying that necessitarianism must be founded on something other than observation. Observation is *a posteriori*; it has reference only to single facts, to particulars; yet the doctrine of necessity, if there is anything in it at all, is of universal application. The doctrine of necessity, let us not be afraid to pronounce it clearly, is of an *a priori* nature. The scientist assumes *a priori*, i. e. even before he makes his observations or experiments, as a general law applicable to every process which takes place, that, whatever happens, happens of necessity in consequence of a cause and in conformity to law, so that the same cause under the same circumstances will produce the same effects. If all the *a priori* reasons, as Mr. Peirce maintains, received a sockdologer from Stuart Mill, then indeed we shall have to abandon the idea of necessity as the superstition of a past and erroneous philosophy and we shall have to start the world of science over again.

Mr. Peirce denies the strict regularity of natural law and introduces an element of chance. He says (*ibid.* p. 336):

"To undertake to account for anything by saying boldly that it is due to chance would, indeed, be futile. But this I do not do. *I make use of chance chiefly to make room for a principle of generalisation, or tendency to form habits, which I hold has produced all regularities.*\* The mechanical philosopher leaves the whole specification of the world utterly unaccounted , which is pretty nearly as bad as to boldly attribute it to chance. I attribute it altogether to chance, it is true, but to chance in the form of a spontaneity which is to some degree regular."

Mr. Peirce is the pathfinder of a new and as yet untried road. He strikes out boldly into the tumultuous ocean of chance, hoping to find in his journey the connection between the East and the West, between contrasts that seem to him otherwise unconnectible. The confidence of the bold discoverer is set forth in the warnings he gives to all seafaring people. He attempts to frighten the ill-informed minds who might innocently venture out in other directions; and he will thus naturally prevent many from falling either into the Charybdis of doubting the propriety of applying the logic of probabilities to the problem of necessity and causation in general, or, worse still,

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\* Italics are ours.

into the Scylla of the *a priori*. The former, he tells us denotes "a state of case-hardened ignorance respecting the logic of science," the latter "a high degree of imperviousness to reason."

Mr. Peirce is well known as one of the keenest logicians now living. Considering this fact I am slow to take up arms against him in defending a case which he so strongly brands beforehand. I must from the beginning plead guilty to a belief in necessity, and having critically revised my view once more I cannot help upholding it. I am fully conscious of the fact that hundreds, thousands, and millions of single experiences (which in Kantian terminology are called *a posteriori* arguments) cannot establish a solid belief in necessity, nor can any imaginable number of sequences prove the rigidity of causation, and I confess freely that I support my thesis with *a priori* reasons. Yet at the same time attention must be called to the fact that neither Mr. Hamilton nor Mr. Mill had any adequate conception of the *a priori*, and Mr. Mill's sockdologer does not disturb in the least the assurance of my view; for the *a priori* can, in my opinion, be based upon the firm ground of experience.

All the many sense-experiences at our command, if considered singly, cannot constitute knowledge. In order to weave the woof of the *a posteriori* into coherent cloth we want the warp of the *a priori*, and I do not see how we can do without it. But the *a priori* is not that mystical hocus-pocus of absolute truth with its impertinent assumptions such as it is presented by pseudo-Kantians and justly denounced by Mill; it is not as Mr. Peirce brands it an "I cannot help believing," it is not a "natural belief," nor is it as others conceive it an innate idea. It is, briefly described, simply and solely formal knowledge, such as  $2 \times 2 = 4$ , to which we attribute universality and necessity and with the assistance of which we are enabled to predict and predetermine certain results beforehand (i. e. *a priori*). We might invent a new name for the *a priori*, the latter having become odious through the denunciations of its enemies and worse still, having been distorted beyond recognition through the misuse to which it was put by its defenders and suppositional friends. Yet that would be another question, and the idea of the *a priori*, i. e. of formal knowledge involving universality and necessity would remain the same.

The universality and necessity of formal knowledge are as a rule taken for granted by scientists. But philosophy can take nothing for granted, and the problem rises : How is the belief in the universality and necessity of formal knowledge to be justified? Mr. Peirce's onslaught on the doctrine of necessity is a challenge to answer this question.

## II.

## CAUSATION NOT MERE SEQUENCE.

Mr. John Venn published some twenty-five or six years ago an excellent treatise called "The Logic of Chance." This work opened the eyes of many to the great importance of the calculus of probabilities as a method of science which was of much wider application than had before been suspected. This admirable work we may boldly say marks a new epoch in the study of logic, it opened new vistas, and many expectations created by it have since been realised. Yet it is to be regretted that the author adopts Hume's erroneous conception of causality and thus implicitly paves the way which Mr. Peirce has actually followed and which leads to a denial of the doctrine of necessity. Concerning "the doctrine of universal causation" Mr. Venn says, in Chapter XIV :

"We will employ the word simply in the sense which is becoming almost universally adopted by scientific men, viz. that of invariable unconditional sequence.

"It is in this sense that the word *cause* is used by Mr. Mill. . . .

"This meaning of the term is rapidly becoming the popular, or rather, the popular scientific one."

This idea of "sequence" however was exactly Hume's mistake, adopted by Mr. Mill and through Mr. Mill popularised among English thinkers. If the nature of cause and effect were really constituted by invariable sequence, then the night might be called the effect of the day because night is invariably consequent upon day.

Hume, taking the ground that cause and effect constitute a sequence, attempted a synthesis of both ; he searched for a proof of their identity and failed. And it was natural that he failed, for cause and effect are so radically different that we cannot bring them into the formula of an equation as "cause = effect." There is no cause that is equal to its effect.

Hume should have considered causation as one single process, and instead of attempting a synthesis, he should have made an analysis. The analysis would have shown that cause and effect are two abstract and correlative terms of one whole and inseparable event. Cause is not identical with effect, but the whole event is identical with itself.

If my finger touches a key of the piano, a chord is struck ; the chord swings and produces certain air-vibrations. In this process from the beginning to the end all the energy employed and the mass of the material particles remain in amount the same, yet there is a change of form taking place. Causation is not mere sequence, but a sequence of quite a special kind. It is a sequence of two states which belong together as an initial and a final aspect of one and the same event.

So long as we know of two events simply that they follow one another, although the sequence may in every case be invariable and unexceptional, we are not justified in calling them cause and effect. No amount of experience is sufficient to constitute causation by a mere synthesis of sequences, and to have appreciated this truth is the immortal merit of the great Scotchman who boldly took the consequence of the argument and acquiesced in scepticism.

The problem, however, is not so desperate as Hume thought. If Hume could have considered his argument in the light which the law of the conservation of matter and energy sheds upon it, he would most likely have abandoned his scepticism ; for causality is perfectly intelligible if conceived not as a synthesis of two radically different events, but as a process of transformation, of which the prior state is called cause and the final one effect.

That two radically different events, which are not thought of as transformation, invariably follow each other without our being able to discover any connection between them, will naturally appear as a mystery ; but that two forms are radically different things, although they may be forms of the same amount of matter and energy, is no mystery. The effect is, or may be, something entirely new. The configuration of things as it appears in the effect, did not exist



before. But for that reason, it is no creation out of nothing, it is not an incomprehensible event, it is no miracle.

It is a very wonderful thing that two congruent regular tetrahedrons, when put together, will form a hexahedron, but the laws of form do perfectly and satisfactorily explain it. Supposing we had no idea of the laws of form or only an incoherent and fragmentary knowledge of them, should we not look upon the result of this combination as a strange and incomprehensible mystery. Two heaps of flour one poured upon the other will give one heap of the same kind and shape but of a larger size. However, the combination of the two four-sided bodies does not produce another four-sided body doubly as large as any of the two four-sided bodies. Nor does it produce an eight-sided body. It produces a six-sided body, which is something quite new. The result is not contained in the conditions singly, for no one can say that six-sidedness is a quality implicitly contained in four-sided bodies.

The process of combining hydrogen with oxygen into water ( $H_2O$ ) is an immensely more complex case, and the qualities resulting from a difference of density as well as configuration are entirely unknown to us. There is nevertheless no reason whatever to consider the process as different in principle; it is a case of transformation in which the amount of matter and energy remains the same.

Whatever the value of the logic of chance may be for scientific reasoning in establishing gradations of certainty and formulating the reliability of a certain belief, we deny most positively its applicability to the principle of causation in general. If we ask what the chance is of a combination of two congruent tetrahedrons becoming a hexahedron, we must answer that the probability is exactly 1, which means certainty, and certainty is but another name for necessity.

Mr. Peirce does not object to necessity in certain cases, he objects to necessity being a universal feature of the world. He objects to the rigidity of causation in so far only as to allow a trifle of chance to enter into nature.

One or two cases or even a hundred, and a thousand, nay millions of millions of cases in which causation is explicable as transfor-

mation is no proof that this must always be so. Mr. Peirce may grant and most likely he does grant that causation in a definite set of experiences is transformation, yet what guarantee do we have for saying that it is the only kind of causation. Might there not be room in this world for another causation which for lack of a full comprehension of its nature, we may call the causation of chance?

We answer that form is a quality of this world, not of some samples of it, but throughout, so far as we know of existence even in the most superficial way, and thus we know beforehand or *a priori* that the laws of form hold good so far as our telescopes sweep through space. We are ignorant as to the qualities dependent upon special forms of matter or energy, and we can acquire any knowledge thereof only through experience; but that is no reason to doubt the validity of causation in general, or to surmise the probability of there being somewhere a different arrangement of nature.

Thus we come to the conclusion that the calculus of probabilities is not applicable to the order of the world as to whether it may or may not be universal. And in corroboration of this our position we quote the following passage from a high authority in the science of logic, who is no less than Mr. Charles S. Peirce himself. "Illustrations of the Logic of Science," (*Popular Science Monthly*, 1877, p. 714):

"The relative probability of this or that arrangement of Nature is something which we should have a right to talk about if universes were as plenty as blackberries, if we could put a quantity of them in a bag, shake them well up, draw out a sample, and examine them to see what proportion of them had one arrangement and what proportion another. But, even in that case, a higher universe would contain us, in regard to whose arrangements the conception of probability could have no applicability."

Mr. Peirce is still more emphatic in another passage which reads (*ib.* 1878, p. 205):

"If any one has ever maintained that the universe is a pure throw of the dice, the theologians have abundantly refuted him. 'How often,' says Archbishop Tillotson, 'might a man, after he had jumbled a set of letters in a bag, fling them out upon the ground before they would fall into an exact poem, yea, or so much as make a good discourse in prose! And may not a little book be as easily made by chance as this great volume of the world?' The chance world here shown to be so

different from that in which we live would be one in which there were no laws, the characters of different things being entirely independent; so that, should a sample of any kind of objects ever show a prevalent character, it could only be by accident, and no general proposition could ever be established. Whatever further conclusions we may come to in regard to the order of the universe, thus much may be regarded as solidly established, that the world is not a mere chance-medley."

Here follows a close reasoning of several pages which ends (on p. 207) with a paragraph beginning with the words:

"This shows that a contradiction is involved in the very idea of a chance world."

And a long paragraph on p. 208 winds up with these sentences:

"The actual world is almost a chance-medley to the mind of a polyp. The interest which the uniformities of Nature have for an animal measures his place in the scale of intelligence."

This is exactly the position which I defend. If universes were as plenty as blackberries we might talk about the order of other universes. They might be four- or five- or  $n$ -dimensional. Yet even in all these cases they would not be void of form. The four-dimensional universe would have another arrangement, but its laws would be none the less orderly, none the less regular, and a higher universe would contain them all. Supposing there were four- or five-dimensional space somewhere, we could state with absolute precision all the formal laws by which bodies of so many dimensions were governed.\*

The order of form and the rigidity of formal laws is as universal and omnipresent as God. They encompass our path and our lying down, they have beset our behind and before. If we ascend up into heaven they are there, if we make our beds in hell, behold they are there. If we take the wings of the morning and dwell in the uttermost parts of the sea, even there they shall lead us and hold us.

### III.

#### MR. PEIRCE'S LOGIC OF SCIENCE.

In spite of the fundamental difference that obtains between Mr. Peirce's and our own world-conception, we must state that there are

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\* See *Fundamental Problems*, p. 55.

many most important points of agreement. Mr. Peirce says in his article "Illustrations of the Logic of Science," (ibid. p. 3 and 7) :

"The object of reasoning is to find out, from the consideration of what we already know, something else which we do not know. \* \* \*

"The settlement of opinion is the sole object of inquiry."

There are according to Peirce several methods of settling opinion, which swayed humanity in an historic succession: (1) The method of tenacity. Doubt being an uneasy and dissatisfied state, we cling tenaciously not merely to believing, but to believing just what we do believe. (2) The method of authority, which is that of the Roman Church and of all great political and religious institutions of the past. (3) The *a priori* method, by which Mr. Peirce understands the fixing of belief agreeably to reason, i. e. to the subjective conviction of the individual thinker. All these methods have their merits, says Mr. Peirce (ibid. p. 13) :

"The *a priori* method is distinguished for its comfortable conclusions. It is the nature of the process to adopt whatever belief we are inclined to, and there are certain flatteries to the vanity of man which we all believe by nature, until we are awakened from our pleasing dream by some rough facts. The method of authority will always govern the mass of mankind. . . . But most of all I admire the method of tenacity for its strength, simplicity, and directness."

It is apparent that the merit of the *a priori* method so called is really a vice. The *a priori* method so called is the basis of agnosticism. If according to my reason this, and according to your reason that, may be the truth, where does truth remain? If truth is purely subjective, truth becomes impossible. The method of settling belief agreeably to our individual tempers is the death of objective truth, of science and philosophy.

Mr. Peirce fully recognises the practical importance of thought. He says :

"The production of belief is the sole function of thought" (ibid. p. 289).

"Our beliefs guide our desires and shape our actions" (ibid. p. 5).

"What is belief? First, it is something that we are aware of; second, it appeases the irritation of doubt; and third, it involves the establishment in our nature of a rule of action, or, say for short, a *habit*" (ibid. p. 291).

"Thus, we come down to what is tangible and practical, as the root of every real distinction of thought, no matter how subtile it may be; and there is no dis-

tion of meaning so fine as to consist in anything but a possible difference of practice" (ibid. p. 293).

Mr. Peirce is very far from considering philosophy as a mere matter of speculation or theory without practical importance. He says :

"What sort of a conception we ought to have of the universe, how to think of the *ensemble* of things, is a fundamental problem in the theory of reasoning."

The *a priori* method, so called by Mr. Peirce, translated into practical life is not only the death of truth but also of morality. The objective criterion of truth is gone, and with it goes the objective standard of right and wrong. If that is true which seems so to my individual reason, then that is right which pleases me best. What is right to me might be wrong to you. Thus this method leads either to moral indifference, or to basing ethics upon the greatest amount of pleasure attainable, (Hedonism, as represented by Mr. H. Spencer, Prof. Harald Höffding, Professor Gizycki, and others,) or to relying upon the individual conscience as an absolute and ultimate authority.\*

The method of settling opinion agreeably to individual reason is at present the most fashionable and widely spread conception, and it shows its influence in the almost universal acceptance of agnosticism to-day. Is that the final decision with which we have to rest satisfied? If it were, we would better return to the method of authority or tenacity. No, it is not the sum of all wisdom. The *a priori* method so called represents a period of transition, which, if persistently pursued, will lead to the bankruptcy of thought, the desperate appearance of which is well disguised in the big sounding and modesty-parading term agnosticism. And here we return to the exposition of Mr. Peirce's views. Mr. Peirce does not accept the *a priori* method, he believes in "the logic of science." Mr. Peirce says :

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\*This is the position of the Societies for Ethical Culture which are not confessedly but practically agnostics. Professor Adler's position is characterised in *The Monist*, Vol I, No. 4, p. 567, 599, and *The Open Court* Nos. 225 and 234. Mr. Salter bases ethics upon "the immovable rock of conscience." (See his *Ethical Religion*, p. 295.)

"To satisfy our doubts, therefore, it is necessary that a method should be found by which our beliefs may be caused by nothing human, but by some external permanency—by something upon which our thinking has no effect. . . . The method must be such that the ultimate conclusion of every man shall be the same. Such is the method of science" (ibid. p. 11.)

"That whose characters are independent of how you or I think is an external reality" (ibid. p. 298).

"All the followers of science are fully persuaded that the processes of investigation, if only pushed far enough, will give one certain solution to every question to which they can be applied. . . . They may at first obtain different results, but, as each perfects his method and his processes, the results will move steadily together toward a destined centre. . . . The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by the truth, and the object represented in this opinion is the real" (ibid. pp. 299-300).

The word "fated" must be understood as Mr. Peirce understands it. He adds in a footnote :

"Fate means merely that which is sure to come true, and cannot be avoided."

#### IV.

#### NECESSITY IN THOUGHT PRESUPPOSES NECESSITY IN FACTS.

I have thus outlined Mr. Peirce's views, not only because his line of reasoning\* is admirable and deserves to be universally known and recognised, but also because it seems to me to have some bearing upon the question at issue.

If the ultimate conclusion of every man concerning reality shall be the same, there must be some truth in the idea of necessity. If there is an opinion "fated to be ultimately agreed to," we are confronted in our representation of reality with something that is inevitable. Shall there be necessity in thought but not in that of which all our ideas are but images and symbols? We can conceive of the necessity in the ideal realm of thought only as a reflection of that necessity which pervades the original and prototype of our thought, which lives in reality.

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\*Ernst Schroeder in his great work *Vorlesungen über die Algebra der Logik* adopts in the main the results of Peirce. A sketch of Mr. Peirce's line of thought, (his *Gedankengang*, as Schroeder calls it,) is found in the *Einleitung*, pp. 107-118.

## V.

## MR. PEIRCE'S EVOLUTIONISM.

I have tried to find an explanation of Mr. Peirce's position which appears to me self-contradictory and I believe I have found the key that will explain it.

I read somewhere a stray remark of Mr. Peirce's in which he demanded that evolutionism should be thorough-going. The conception of evolution in vogue at present, he said, stops short at a certain point, and substitutes for an explanation the unknowable. Mr. Peirce says :

"Does not space call for some explanation ? Is not that a half-way philosophy which in these our days does not explain, or at least hold out some promise of explaining, why space is continuous, why it has such a wonderful uniformity in all its parts, why there are neither more nor less than three dimensions everywhere, why every closed curve can, by a continuous change of position, size, and form, be brought into coincidence with every other, and why the three angles of a triangle make exactly one hundred and eighty degrees, or at least so very closely so that we cannot tell whether they make more or less ?"

Mr. Peirce does not intend to halt before these problems, but to explain them and carries the principle of evolution to its ultimate conclusions, so as to explain from it not only the forms of living organisms but also the laws of nature including the laws of space. Mr. Peirce declares in his article "The Architecture of Theories" (*The Monist*, Vol. I, No. 2, p. 165) :

"Uniformities are precisely the sort of facts that need to be accounted for. . . . Law is *par excellence* the thing that wants a reason."

And what he means by it is further elucidated in his article "The Doctrine of Necessity Examined" (*The Monist*, Vol. II, No. 3, p. 334) :

"That single events should be hard and unintelligible, logic will permit without difficulty : we do not expect to make the shock of a personally experienced earthquake appear natural and reasonable by any amount of cogitation. But logic does expect things *general* to be understandable. To say that there is a universal law, and that it is a hard, ultimate, unintelligible fact, the why and wherefore of which can never be inquired into, at this a sound logic will revolt ; and will pass over at once to a method of philosophising which does not thus barricade the road of discovery."

It is perfectly true that "law is *par excellence* the thing that wants a reason," and any explanation that explains it by the assumption of an unknowable is unphilosophical. I agree with Mr. Peirce that we must not halt here; but I have no confidence in his method of explanation. Mr. Peirce's original idea, then, and I should add, his main mistake, is that he proposes to explain the origin of natural law by evolution.

In his legitimate anxiety to explain law, Mr. Peirce declares chance to be exempt therefrom. He says :

"That a pitched coin should sometimes turn up heads and sometimes tails calls for no particular explanation." (*The Monist*, Vol. I, No. 2, p. 165.)

But chance in our opinion needs exactly as much explanation as anything else. Mr. Peirce very improperly identifies "that which cannot be accounted for" with "that which need not be accounted for." Absolute chance, if it existed, would *not* so much *not* call for a particular explanation as actually be unexplainable, and being incapable of explanation, it would have to be considered as an unintelligible fact, as inscrutable, incomprehensible, and mystical. On the assumption that chance need not be accounted for, Mr. Peirce builds the architecture of his theory. He says :

"Chance is first, law is second, the tendency of habits is third."

The application of this general statement is set forth in the following passage :

"In psychology Feeling is First, Sense of reaction Second, General conception Third, or mediation. In biology, the idea of arbitrary sporting is first, heredity is second, the process whereby the accidental characters become fixed is third."

How little after all we can escape the determinism of law as being a feature of the world will be seen from the fact, that the explanation for the evolution of law is presented by Mr. Peirce as being itself a law, i. e. a formula describing a regularity supposed to obtain in facts. Does not Mr. Peirce's formula, supposing it to be true, deserve the same reproach which he casts upon natural law in general, viz., that it is "a hard, ultimate, unintelligible fact, the why and wherefore of which can never be inquired into"?



## VI.

## WORLD-CONSTRUCTIONS.

There are two methods of philosophising, one starts with ideas which are supposed not to need any explanation, the other starts from facts and uses facts as data. The former is the method of the constructionist or ontologist, the latter that of the positivist. The constructionist attempts to beget a world-theory in the same way that God was supposed to have created the world; he attempts to bring it into being either out of a real nothing or out of something like nothing. He constructs a world-theory out of the self-evident, out of the absolute, out of the indubitable, or out of that the contrary of which is inconceivable. The positivist, however, employs facts as the given material, which he works out into a consistent and systematic whole. The former view is synthetic and constructive, the latter is analytic and descriptive. The former view is the method of Hegel, Oken, and also of Mr. Spencer, the latter is the method of all scientists and the ideal of the positive philosophy.

Mr. Peirce although very positivistic in his logic of science, must in philosophy still be counted among the constructionists.

Chance is to Mr. Peirce as much absolute as was to Hegel the idea of "abstract being," which as such, Hegel said, is equivalent to "non-being." Non-being need not be accounted for. So Hegel starts with this idea, and finding that "becoming" is the oscillation between being and non-being launches his abstract thought upon the terra firma of reality.

In the same way and with similar ingenious ingenuity Oken starts the world with zero. Zero or non-being need not be accounted for. Its existence calls for no particular reasons. What is zero? We can conceive it as " $0 = 1 - 1$ ." Thus we have " $+ 1$ " and " $- 1$ ," two units. The whole world, according to Oken, is only a disintegration of Nothing, an equation of enormous complexity but always equal to zero. And that explains the world!

Mr. Spencer adopts "the principle of setting out with propositions of which the negations are unconceivable," without being aware that any inveterate belief or prejudice can be defended from

that standpoint. The principle is purely subjective. It does not admit of any objective verification and limits knowledge to individual conception. If Mr. Spencer's principle were admissible, we could not refute the adversaries of the Copernican system, when they declare that the rotation of the earth up on which we stand is inconceivable. The maxim that that proposition is most certain the negation of which is inconceivable might after all, and it actually did very often, come into conflict with facts. Many propositions are now confidently accepted which were formerly declared to be positively inconceivable.

Mr. Peirce, I say, starts the world with an abstract idea of a something of which he assumes we need not give any account, as did the great ontologists of former times. He constructs, agreeably to his reason, a theory of the way in which the world might have originated, and thus he falls into the mistake criticised by himself as the *a priori* method. Yet the weakest point of Mr. Peirce's system is that his "absolute chance" begets order; irregularity becomes law by practice, as if by a sufficiently prolonged shaking the dice would by and by acquire the habit of turning up the same faces each time.

The present world-conception of the scientist regards natural laws as eternal. The order that prevails in these laws constitutes the principle of evolution and changes the chaos of a nebula into a well-arranged planetary system. Thus the original chaos is properly speaking no chaos. It is in all its parts regulated by law and only appears chaotic in comparison with more advanced stages of evolution.

Desirous to account for the regularities of nature Mr. Peirce proposes the idea that nature in the beginning was a real, true chaos, without order, without laws, the single actions of reality taking place irregularly and in a sportive manner. Absolute chance prevailed. Everything was undetermined, exactly as much so as a man is undetermined in his action before his belief is settled. Yet a man, by and by, forms a belief and acts accordingly, not once or twice, but often, until a habit is formed. Thus Mr. Peirce assumes, Nature's actions are first undetermined, they may be of this kind or of another kind. The same particle of reality may under the same con-

ditions act in different ways, yet it acts somehow ; it acts again, and repeats a certain kind of action more frequently than others, thus forming habits. Laws according to Mr. Peirce are the habits acquired by nature.

The proposition of Mr. Peirce's logic of science points out another method of constructing a world-conception. The recognition of reality in the sense as he conceives it, admonishes us that our world-conception should be a picturing, a mirroring, an imitation of the objective world of facts. It should not be the architecture of a theory, but first an analysis and then a reconstruction of experience ; it should be a description of facts, methodically arranged.

## VII.

## FACTS AND LAWS.

That which we call natural law is not the description of a certain special and concrete form of existence which is now or then and here or there, but of some general quality of facts which is everywhere and always. The former, i. e. every special and concrete form of existence, can be explained by evolution, the latter, i. e. natural law, cannot. The former has to be accounted for by the law of causation, the latter by the principle of sufficient reason. And it is this distinction between cause and reason which Mr. Peirce does not seem to have regarded.

Every special form of existence must, at least theoretically, be traceable as the effect of some cause and every law of nature must be explainable by showing its connection with other natural laws. The only thing in the world of which we cannot and need not give account is the existence of facts itself, or being in general, which is the stubborn presence of reality in us ourselves and also outside of us, objected to our own being as an independent power to which we have to adapt our conduct. We need not prove its existence, for it exists. If anything is ultimate, facts are ultimate ; and cognition is nothing but the reconstruction of facts for the purpose of orientation among them, it is a methodical description of reality in the symbols of the feelings that exist in sentient beings.

A scientist having observed a special process of nature, describes it, if possible, in such a way that it is recognised as a trans-

formation. A description of this kind is called an explanation. It renders the process intelligible to us ; it is complete and exhaustive. In order to make such a description available for comprehending other cases of the same or similar kind, we have to introduce another principle, which is that of economy. We must single out those features which are common to a certain class and remove all diversity and specificness. All specificness and diversity are transient features due to special conditions ; they disappear with these special conditions. Thus the notion of natural law involves as an essential characteristic and fundamental quality the absence of the incidental and the temporal.

Natural laws describe the facts of nature *sub specie aeternitatis*. They cease to be natural laws in the proper sense of the word as soon as they are conceived, like legal laws, as products of evolutions, which have appeared in time and may disappear again. Eternity is the characteristic feature of a natural law, it is its backbone, the essence of its being, its *conditio sine qua non*.

Thus in considering a natural phenomenon we are led to distinguish between its cause and its reason : Its cause is something special, it is an individual event, happening in time, and accordingly being transient ; it is an occurrence of some kind, it is a single and definite fact. However its reason is not anything special, it is something general ; it is not a single and definite fact, but it is a law of universal application ; it is not transient, but a conception of things in which the incidental and temporal are eliminated. A reason is applicable to all cases of the same kind and also to all cases of any time. A cause, i. e. a fact, if it truly exists, is real (not true) ; a law, i. e. a reason, if it really obtains in nature, is true (not real), and any attempt at explaining natural laws as a product of evolution, being based upon the view that regards them as causes not as reasons, as real not as true, as a description of temporal existences, not as viewing facts *sub specie aeternitatis*, must from the outset be a failure.\*

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\* I laid down my views on the subject in a short monograph of only 82 pages, entitled *Ursache, Grund und Zweck, eine philosophische Abhandlung zur Klärung der Begriffe* (Dresden : R. von Grumbkow, Hof. Verlag, 1883). In all main points

Mr. Peirce attempts to explain natural laws as if they were single and concrete facts. Where we have to look for reasons he evidently employs the method of searching for causes. He treats that which in its very nature is eternal, as if it were temporal. He regards the everlasting, the imperishable, the immutable as if it had originated, as if it were transient, as if it were the product of a development.

## VIII.

## LAWS NOT INEXPLICABLE.

But is not Mr. Peirce justified in declaring that law remains unexplained? Is law really as he says "hard, ultimate, inexplicable, immutable"? Law is to be regarded as immutable but not as ultimate or inexplicable, and thus Mr. Peirce's denunciation of natural law is not

I maintain the same standpoint still. See also *Fundamental Problems*, the chapter on Causality, pp. 79-91 and 96-109.

Since the publication of my German pamphlet my confidence that we can, (not only in the special sciences such as chemistry, mineralogy, botany, etc., but also in philosophy) arrive at truth, has rather been confirmed than shaken. We can create a common ground on which all philosophers agree, as much as mathematicians agree concerning the Pythagorean theorem. But in order to achieve this ideal, philosophers must abandon all attempts at originality. The hankering after originality is an inherited evil in the family of philosophers. The first philosophers were poets, priests, and prophets; later on in the natural evolution of human culture, a differentiation of their combined functions took place. Originality is a virtue in the poet but a vice in his brother, the philosopher. The philosopher's ideal must be to free himself of all individualism, subjectivity, and original conceptions; he must become strictly objective. He must renounce his personal likes and dislikes, and make his soul a mirror of nature, faithfully and correctly to represent the facts and nothing but the facts. This is the ethics of philosophical inquiry, and the philosophy that takes its stand on this principle we call positivism.

Almost all divergencies of importance in the different philosophical systems can be traced to different conceptions or rather misconceptions of causation.

This last century since Kant has been the most fertile age of original world-theories, all different in style and manner of construction, but all alike in so far as the author of each system had strained his utmost efforts to be original. Thus all these world-theories were so many beautiful poems on ontology, they were so many grand air-castles produced by the magic wand of a fairy-tale causation. The philosopher's aspiration must not be to present original ideas but to reach that one solution which any other unbiassed thinker must find, to express that truth which in the end will have to be recognised universally, to formulate facts in objective exactness. The degree of originality in philosophic thought marks the degree of aberration from the common aim of the one sole solution, and the greatest source of original ideas is the confusion of cause and reason, of *Ursache* and *Grund*, of event and law, of fact and truth.

justified. All natural laws must be conceived as forming one system ascending from the lower to the higher, from the more special to the more general. And the more comprehensive law represents in each case the reason for the less comprehensive law which is comprised in it. Thus we must finally reach the most general or all-comprehensive law, which is a description of that which is a universal quality of existence.

There is a wrong notion prevalent among many thinkers that the most comprehensive description (law or reason) of a certain kind should, as in a nutshell, contain and immediately explain all that which it embraces, so that if once in its possession, we should be omniscient as to all the rest. The most universal law is looked upon as the centre of existence—*das Innerste der Welt*. If we could but get there, we should solve all the world-problems by mere intuition. This is the old error of the students of magic, whose hope is expressed by Faust when he says:

“*Dass ich erkenne, was die Welt  
Im Innersten zusammenhält.*”

That I may detect the inmost force  
Which binds the world and shapes its course.—*Bayard Taylor.*

Comprehension is not attained simply by finding out and stating the most general feature of a certain class of facts; comprehension does not alone consist of generalisation but also of discrimination. The differences among less general laws must be recognised as results of special conditions. And any knowledge of a general law reveals nothing about the special conditions under the influence of which the same law will work differently.

It is but too often overlooked that the more general a statement is, the less it will contain, the vaguer it will appear, the emptier it must be. There is no royal road to cognition and mere generalisation is of no avail. We shall have to investigate the details of every case and view it in its relation to the general law. The general law must be viewed under those conditions which will invariably produce the same special modifications.

But do not the most general reasons remain uncomprehended?

Do we not at last arrive at an ultimate law which, then, must be hard and inexplicable?

Those laws which appear in every respect to be universal are the formal laws of mathematics, arithmetic, and their kindred sciences. And all these formal sciences are not only *not* mystical, unintelligible, and inexplicable, but they are the most perspicuous, most reliable, and most certain knowledge we possess. All their theorems admit of the most rigid demonstration, and the last shadow of mysticism has been removed by Hermann Grassmann. Owing to his searching investigations we are no longer in need of axioms which were formerly supposed to be the indispensable basis of mathematics.

There is however a basis of formal thought left which we cannot dispense with; that is the idea of sameness, generally formulated as the law of identity. Is perhaps the law of identity by which all the regularities of nature are to be accounted for, inexplicable? Hardly! The idea of sameness has a solid basis in the facts of experience.\*

#### IX.

#### CONCLUSION

The contrast between Determinism and Indeterminism is old, yet Mr. Peirce has worked out quite a new aspect of Indeterminism and places it upon a basis that appears to be a more solid foundation than it ever before possessed. At the same time he succeeds in making some of its consequences so plausible, that in this new garb it will appeal more strongly than before to scientifically trained minds. With all deference to the logical acuteness of Mr. Peirce and with all admiration for the originality and depth of his thought, we cannot, however, accede to the new philosophy which he proposes.

Mr. Peirce's propositions go to the core of all problems, they upset everything that has heretofore been considered as firm ground, they question the most fundamental concepts of the world-concep-

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\*I expect to discuss the problems of sameness, of chance, of mechanicalism, and the freedom of will in the next number of *The Monist* under the caption *The Doctrine of Necessity : Its Basis and its Scope*.

tion upon which all scientific reasoning and the methods of the positive philosophy rest. Thus they set us a-thinking and will help us to attain greater clearness on points which are to all of us of greater concern than may at first sight appear. For the fundamental problems of philosophy have a deep practical importance. Their importance is less noticeable, less obvious, but at the same time more sweeping the more fundamental they are.

Let us here in concluding this article consider only one, but the most striking one, of the consequences to which both views lead.

Indeterminism leads to a conception of God which although we may call it "mind" and place it at the beginning of the world, is pure chance or the indeterminateness of an arbitrary sporting. Determinism on the other hand leads to a recognition of God as that something in nature that is as it is, that has been and will be. Science, whose method of cognising the truth is and can only be to know in parts, attempts to describe the partial qualities of this something in natural laws.

It is of great consequence in practical life whether God is what the name Jahveh intends to convey, eternal and unalterable being, immutable sameness in the perpetual flux, irrefragable law in the changes of evolution, or whether it is the *Τυχή* of the pagans, i. e. indeterminable and absolute chance, unaccountable, irregular, capricious, and uncertain.

The God-idea is the basis of ethics. It matters little whether we use or avoid the name God, for the atheist has also a God-idea in his conception of that existence in which he lives and moves and has his being. This God-idea is always the ground from which we derive our rules of conduct; and whenever we change, not our terminology but our idea of God, we shall as a matter of consistency have to change our views of ethics also.

EDITOR..